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RESEARCH ARTICLE

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Notulae to the Italian alien vascular flora: 7

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Abstract

In this contribution, new data concerning the distribution of vascular flora alien to Italy are presented. It includes new records, confirmations, and status changes for Italy or for Italian administrative regions of taxa in the genera *Abies*, *Actinidia*, *Alooe*, *Amaryllis*, *Anredera*, *Arctotheca*, *Bidens*, *Cardiospermum*, *Celosia*, *Commelina*, *Cotoneaster*, *Cyclamen*, *Eclipta*, *Euphorbia*, *Grevillea*, *Hedera*, *Hibiscus*, *Impatiens*, *Juglans*, *Kalanchoe*, *Koelreuteria*, *Lindernia*, *Melinis*, *Myriophyllum*, *Nandina*, *Nicotiana*, *Oenothera*, *Oxalis*, *Parthenocissus*, *Phoenix*, *Phyllanthus*, *Physalis*, *Plumbago*, *Pteris*, *Quercus*, *Setaria*, *Symphytum*, *Tagetes*, and *Washingtonia*. Nomenclatural and distribution updates, published elsewhere are provided as Suppl. material 1.

Keywords

Alien species, floristic data, Italy

How to contribute

The text for the new records should be submitted electronically to Chiara Nepi (chiara.nepi@unifi.it). The corresponding specimen along with its scan or photograph has to

be sent to FI Herbarium: Museo di Storia Naturale (Botanica), Sistema Museale di Ateneo, Via G. La Pira 4, 50121 Firenze (Italy). Those texts concerning nomenclatural novelties (typifications only for accepted names), status changes, exclusions, and confirmations should be submitted electronically to: Gabriele Galasso (gabriele.galasso@comune.milano.it). Each text should be within 2,000 characters (spaces included).

Floristic records

Abies cephalonica Loudon (Pinaceae)

+ (NAT) **SAR**: Tempio Pausania (Sassari), Cime del Limbara, abetaia Madonna della Neve (WGS84: 40.51057N; 9.10121E), abetaia, 30 January 1994, *A. Ruggero* (*Herb. A. Ruggero*); Tempio Pausania (Sassari), Monte Limbara, Punta Balestrieri (WGS84: 40.51035N; 9.10816E), graniti ercinici, 1240–1260 m, 19 January 2008, *G. Bacchetta, A. Congiu* (CAG); Berchidda (Sassari), Valle di Suprappare (WGS84: 40.841674N; 9.167793E), graniti, garighe, ericeti, rocce, 1132 m, 21 May 2018, *G. Calvia* (FI, *Herb. G. Calvia*). – Naturalized alien species new for the flora of Sardegna.

This species is endemic to Greece, but it was introduced in other countries for reforestations (Farjon 2017). Recently it has been considered as naturalized in Friuli Venezia Giulia, Marche, Umbria, and casual in Abruzzo and Sicilia (Galasso et al. 2018a). In Sardegna, it was planted in several mountain areas starting from 1933 (Pavari and De Philippis 1941). In the Limbara massif (NE Sardegna), where many sparse patches of reforestations occur, this species is now naturalized, being found in garrigues, heaths and rocky places as far as 1 km far from plantation sites. Abundant presence of seedlings and saplings is observable nearby and inside the reforestations, and adult trees reach heights of 8–10 m. In the locality Badde Salighes (near Villa Piercy, Bolotana, Nuoro), this species was introduced for ornamental purposes.

G. Bacchetta, G. Calvia, A. Ruggero

Actinidia deliciosa (A.Chev.) C.F.Liang & A.R.Ferguson (Actinidiaceae)

+ (CAS) **LIG**: Castiglione Chiavarese (Genova), impluvio sotto la cresta del Monte Merelle, versante N (WGS84: 44.25705N; 9.53501E), boscaglia igrofila, 424 m, 17 June 2018, *A. Di Turi, C. Aristarchi* (FI, GDOR, GE). – Casual alien species new for the flora of Liguria.

It is a widely cultivated plant, native to East Asia, recorded in Italy as casual for Lombardia, Trentino-Alto Adige, Veneto, Emilia-Romagna, and Lazio (Galasso et al. 2018a). Well developed specimens have been found in two sites a few hundred metres away: in both cases they grow in hygrophilous stands with *Alnus glutinosa* (L.) Gaertn., *Acer pseudoplatanus* L., and *Frangula alnus* Mill. susbp *alnus*. The recorded area is located within the SAC IT1343412 "Deiva – Bracco – Pietra di Vasca – Mola".

A. Di Turi, C. Aristarchi

Alooe arborescens Mill. (Asphodelaceae)

+ (CAS) **PUG**: Isole Tremiti (Foggia), Isola di San Domino, loc. Cameroni (WGS84: 42.116391N; 15.493383E), dirupo costiero colonizzato da *Pinus halepensis*, ca. 30 m, 27 July 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Some individuals of this species grow under *Pinus halepensis* Mill. subsp. *halepensis* trees on a carbonate steep coastal cliff. The plants grow along with *Mesembryanthemum cordifolium* L.f. and *Phagnalon rupestre* (L.) DC. subsp. *illyricum* (H.Lindb.) Ginzb., on a little compact rock face exposed to East and partially shaded, not far from the sea. They may have originated by vegetative propagation from cultivated plants, used as ornamental in some surrounding private gardens. This species is frequently cultivated in the Mediterranean Italy and it is known as a casual alien in Liguria, Toscana, Lazio, Campania, and Basilicata, while it is naturalized in Sardegna (Galasso et al. 2018a).

N. Olivieri

Amaryllis belladonna L. (Amaryllidaceae)

+ (NAT) **SIC**: Savoca (Messina), loc. Pineta di Savoca (WGS84: 37.957310N; 15.338410E), sottobosco di un impianto forestale a *Pinus pinea* e *Robinia pseudoacacia*, 25 October 2018, *F. Luchino* (FI). – Naturalized alien species new for the flora of Sicilia.

Amaryllis belladonna is native to South Africa, but it is now distributed in several tropical, subtropical, and temperate regions of the world (Govaerts et al. 2018). According to Galasso et al. (2018a), in southern Italy this species occurs in Campania, Puglia, and Calabria. Many individuals grow in a shady habitat in a reforestation with codominance of *Pinus pinea* L. and *Robinia pseudoacacia* L., near Savoca (Messina), possibly escaped from neighboring gardens or flowerbeds where this species is widely cultivated as ornamental. The population recorded here has been known for about 15 years and is constantly expanding. In Sicilia, this species occours also in Gibilmanna (Cefalù, Palermo: *M. Barone*, pers. obs.), Rabotano (Piazza Armerina, Enna: *G. Messina*, pers. obs.), Antillo (Messina: *G. Coslovi*, pers. obs.), Pizzo Castellana C.da San Guglielmo and along SS286 approximately at Km 1–2 (Castelbuono, Palermo: *A. La Rosa*, pers. obs.).

F. Luchino, O. Caldarella, A. La Rosa

Anredera cordifolia (Ten.) Steenis (Basellaceae)

+ (NAT) **SAR**. – Status change from casual to naturalized alien for the flora of Sardegna.

Anredera cordifolia, originating from South America, is reported as invasive in Italy where, in the last 20 years, it became naturalized in many coastal areas (Pasta et al. 2016). This species was reported so far only as casual in Sardegna (Galasso et al. 2018a). Additional records are reported by Campus and De Pascali (2017) for Santa

Teresa di Gallura, and for Sant'Antioco island in an abandoned field. During 2018, it was recorded as naturalized in three new sites: in the town of Nuoro, escaped from cultivation and covering about 50 square metres; along the shores of River Cedrino (Orosei); along roadsides in the locality San Giovanni (Posada).

M. Manca, G. Brundu

Arctotheca prostrata (Salisb.) Britten (Asteraceae)

+ (CAS) **ITALIA** (**CAM**): Napoli (Napoli), Parco Virgiliano (WGS84: 40.799727N; 14.180829E), sito erboso al margine del bosco di latifoglie, 142 m, 14 August 2018, *A. Stinca, R. Vetromile* (FI, PORUN–Herb. Stinca). – Casual alien species new for the flora of Italy (Campania).

Arctotheca prostrata is a South African perennial herb, showing long stolons rooting at nodes. This species has been introduced in other parts of the world, such as USA, Mexico, and Australia (Hinojosa-Espinosa and Villaseñor 2015), but it was not reported for Europe so far. The population recorded here covers an area of approximately 5 m^2. *A. prostrata* is found in very disturbed grassland at a wood margin. This alien species was probably introduced via stolons in soil transportation. Specimens were identified according to Mahoney and McKenzie (2012).

A. Stinca, R. Vetromile

Bidens subalternans DC. (Asteraceae)

+ (NAT) **TOS**: Firenze (Firenze), stazione ferroviaria dello Statuto, binari (WGS84: 43.787222N; 11.250833E), abbondante negli erbai ruderali fra i binari della ferrovia, 2 November 2018, *F. Selvi* (FI). – Naturalized alien species new for the flora of Toscana.

This Central-South American species occurs as an invasive neophyte in most Italian regions, from Friuli Venezia Giulia and Lombardia in the North to Sicilia in the South (Galasso et al. 2018a). It is part of ruderal communities in warm and xeric habitats close to urban areas, most commonly road margins, escarpments and railways, most often in sites showing Mediterranean or sub-Mediterranean climate. In Firenze, it grows abundantly along a relatively long stretch of the main national railway, from the station "Statuto" towards the eastern and southeastern outskirts of the town. It was still in flower and abundantly in fruit in October 2018.

F. Selvi

Cardiospermum halicacabum L. (Sapindaceae)

+ (CAS) **PIE**: Saluzzo (Cuneo), loc. Terre Rosse (WGS84: 44.641560N; 7.472558E), area collinare incolta vicino ad area boschiva, 369 m, 4 October 2017, *M. Dutto, G. Malfi* (FI). – Casual alien species new for the flora of Piemonte.

Cardiospermum halicacabum is a herbaceous perennial climbing plant native to the northern and tropical America. It is cultivated as an ornamental and may be found as naturalized in the warmer regions of southern Europe. In Italy it has been reported for the first time as a naturalized alien for Calabria and Sicilia, and as a casual for Sardegna (Galasso et al. 2018a). The cultivation in Piemonte is attested since the nineteenth century by some specimens preserved in TO: three specimens collected in the Turin Botanical Garden (from 1806 to 1921), a specimen cultivated in Alba (Cuneo), and four specimens without indication of the collecting site. In the recorded site five plants occur, in a second locality in Saluzzo [Saluzzo (Cuneo), loc. Terre Rosse (WGS84: 44.642030N; 7.472003E), orto famigliare vicino a vecchio frutteto, 352 m, 4 October 2017, *M. Dutto*], nine plants were observed. Flowering period goes from June to October and individuals produce an average of 3–4 fruits each. A thorough investigation was conducted between the fund owners and the residents in neighboring areas: the present or past cultivation of the species for ornamental purposes has not emerged and the people did not know it. Since studies based on bioclimatic modeling show a high potential for expansion (Gildenhuys et al. 2013), at the end of the growing season the specimens have been eradicated and the site will be monitored in the years to come.

M. Dutto, D. Bouvet

Celosia argentea L. (Amaranthaceae)

+ (CAS) **PUG**: Ugento (Lecce), fraz. Torre San Giovanni (WGS84: 39.875000N; 18.146813E), vegetazione disturbata al margine di una strada interpoderale presso la costa ionica, ca. 3 m, 21 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

This species appears with some individuals in a disturbed vegetation, dominated by *Phragmites australis* (Cav.) Trin. ex Steud. subsp. *australis*, at the edge of a country road. The plants grow in a flat coastal area, on red soil with good water availability.

N. Olivieri

Commelina erecta L. (Commelinaceae)

+ (CAS) **ITALIA** (**SIC**): Palermo (Palermo), centro urbano, all'angolo tra Via M. Rapisardi e Via N. Morello (WGS84: 38.134187N; 13.343394E), marciapiede, 8 October 2018, *O. Caldarella* (FI). – Casual alien species new for the flora of Italy (Sicilia).

Commelina erecta is native to Central America (Faden 2000) and according to Kumar (2011) is currently distributed in Americas, tropical Africa, West Indies, Australia, and Asia. Israel is the only known place in the Mediterranean basin for this species, so far (Danin 2015). A few individuals grow in a sidewalk near a manhole, inside the fissure of lithic material of the gutter, probably originating from the glass or garden cultivation in the nearby dwellings.

O. Caldarella, A. La Rosa, F. Luchino, E. Tornatore

Cotoneaster pannosus Franch. (Rosaceae)

+ (CAS) **TOS**: Bagno a Ripoli (Firenze), 2 km a E di Villamagna, lungo la strada sterrata che porta in loc. Torrino (WGS84: 43.76330N; 11.36026E), gariga e boscaglia meso-xerofila, 250 m, 21 July 2018, *F. Roma-Marzio, L. Peruzzi* (FI). – Casual alien species new for the flora of Toscana.

Cotoneaster pannosus is a popular ornamental evergreen shrub, native to China (Lu and Brach 2003). It was introduced and escaped from cultivation in United States, Europe, South Africa, Pacific Islands (Hawaii and New Zealand), and Australia (Fryer et al. 2014). In Italy, *C. pannosus* was recorded as naturalized in Lombardia, and as casual in Trentino-Alto Adige, Liguria, and Puglia (Galasso et al. 2018a). We found one fruiting adult individual and two small plants along a pathway at the edge of a wood. Possibly, the plants originated from seeds of individuals cultivated in a country house placed in close proximity.

F. Roma-Marzio, L. Peruzzi

Cyclamen persicum Mill. (Primulaceae)

+ (CAS) **ABR**: Lanciano (Chieti), Via A. Cacciaguerra (WGS84: 42.229116N; 14.392751E), base del muro perimetrale di un edificio, ca. 285 m, 8 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

A young individual of this species developed into a crevice at the base of the perimeter wall of a building, near a rain gutter downspout in a shaded site in the town. The plant may have originated from seeds produced by individuals grown as ornamental in neighboring buildings. *Cyclamen persicum* is a species native to South-Central Turkey, Syria, Lebanon, Israel, Jordan, the Greek islands of Crete, Rhodes and Karpathos, as well as to Algeria and Tunisia, now widely cultivated for ornamental purpose. In Italy, this species is reported as casual alien in Lombardia and Sardegna (Galasso et al. 2018a).

N. Olivieri

Eclipta prostrata (L.) L. (Asteraceae)

+ (NAT) **LAZ**. – Status change from casual to naturalized alien for the flora of Lazio.

This species, native to Asia, is a widely distributed and a common weed in warm temperate to tropical areas worldwide, where it grows commonly in moist places (Holm et al. 1977). It is considered casual alien in Lazio (Galasso et al. 2018a), distributed mainly along the Tyrrhenian coast from the municipality of Santa Marinella (Roma) to Formia (Latina) (Anzalone et al. 2010; Lucchese 2017). Based on recent observations, the species results naturalized on sandy soil along the coast of the Lake Bracciano (Roma), from the municipality of Anguillara Sabazia to Bracciano, and Trevignano Romano. In these sites, large populations occur with an important renewal.

S. Buono, A. Scoppola, S. Magrini

Euphorbia davidii Subils (Euphorbiaceae)

+ (NAT) **TOS**: Pontedera (Pisa), stazione ferroviaria di Pontedera-Casciana Terme (WGS84: 43.662113N; 10.629512E), tra i binari nella massicciata ferroviaria, 13 m, 4 October 2018, *G. Ferretti, M. Mugnai, E. Corti* (FI); Grosseto (Grosseto), fraz. Alberese, stazione ferroviaria di Alberese Scalo (WGS84: 42.640182N; 11.134348E), nella massicciata ferroviaria in prossimità dei binari e nelle aree marginali, assieme a *Euphorbia nutans*, 23 m, 17 November 2018, *M. Mugnai, S. Di Natale, L. Lazzaro, G. Ferretti* (FI). – Naturalized alien species new for the flora of Toscana.

Euphorbia davidii is an alien species native to North America, usually retrieved along railways or in agricultural land (Viggiani 2015) and previously recorded only for northern Italy (Galasso et al. 2018a). We found two abundant populations in Pontedera and Alberese Scalo railway stations, located in the North and South of Tuscany, respectively. This distribution suggests the possible presence of other populations within the region and underlie the status of naturalized for the region.

M. Mugnai, E. Corti, L. Lazzaro, G. Ferretti

+ (NAT) **LAZ**: Ferentino (Frosinone), stazione ferroviaria (WGS84: 41.657718N; 13.245576E), tra i binari, 160 m, 16 October 2017, *E. Fanfarillo* (RO); *ibidem* (WGS84: 41.65695N; 13.24635E), tra i binari, 160 m, 12 September 2018, *E. Fanfarillo* (FI, RO); Morolo (Frosinone), stazione ferroviaria (WGS84: 41.667064N; 13,194339E), abbondante tra i binari e sulle banchine, 160 m, 10 July 2018, *E. Fanfarillo* (FI, RO). – Naturalized alien species new for the flora of Lazio.

The population recorded in Ferentino was observed for the first time in October 2017; it appeared again, more conspicuous, in September 2018. In Morolo, this species was discovered in July 2018; it looks more abundant than in Ferentino and colonizes both the railways and the platforms. The invasive potential of this taxon (Marchessi et al. 2011) suggests that it needs to be constantly monitored.

E. Fanfarillo, G. Nicolella

Grevillea robusta A.Cunn. ex R.Br. (Proteaceae)

+ (CAS) **LAZ**: Roma (Roma), Via C. De Lollis (WGS84: 41.900975N; 12.515406E), interstizi tra muro e marciapiede, 47 m, 11 June 2018, *E. Fanfarillo* (FI). – Casual alien species new for the flora of Lazio.

This species is cultivated as an ornamental tree along Via Cesare De Lollis, where every year it produces abundant flowers and fruits. Juveniles grow in the interstices between a wall and a sidewalk; rare seedlings were also observed in wall cracks.

E. Fanfarillo

Hedera hibernica (G.Kirchn.) Bean (Araliaceae)

+ (NAT) **PIE**: Torino (Torino), Mirafiori Sud, bosco di ripa del Fiume Sangone, a valle della ciclopista del Sangone situata su Via Fratelli Bandiera (WGS84: 45.006917N; 7.655493E), bosco di ripa, ca. 230 m, 21 October 2018, *M. Lonati, S. Ravetto Enri* (FI); Grugliasco (Torino), area industriale di Strada del Portone, scarpate del sovrappasso ferroviario di Via Maserati, su entrambi i lati della ferrovia (WGS84: 45.046235N; 7.594065E), scarpata, ca. 275 m, 26 November 2018, *M. Lonati, A. Mainetti* (FI). – Naturalized alien species new for the flora of Piemonte.

This is a ground cover plant frequently escaping from cultivation (McAllister and Rutherford 1990), reported in Italy for Lombardia, Trentino-Alto Adige, and Toscana (Galasso et al. 2018a). Both the above-mentioned populations form dense stands in the underwood of disturbed woodlands, already invaded by other alien species. The first one has colonized more than 300 m^2 close to an illegal landfill of plant material from private gardens; the second one is about 100 m^2, and originates from cut branches of a private hedge flowed on the Sangone river.

M. Lonati, S. Ravetto Enri, A. Mainetti

Hibiscus syriacus L. (Malvaceae)

+ (CAS) **PUG**: Brindisi (Brindisi), loc. Casale, presso Via Santa Maria del Casale (WGS84: 40.644697N; 17.941041E), base di muro ombroso, ca. 5 m, 23 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Some young plants grow together with ruderal vegetation at the base of a wall built with blocks of limestone and concrete, in a shady and rather humid area near the port of Brindisi. Nearby there are some enclosed gardens where the species could be cultivated and from which the seeds may have come. *Hybiscus syriacus* is known as a casual alien in Piemonte, Lombardia, Veneto, Emilia-Romagna, Trentino-Alto Adige, Friuli Venezia Giulia, Toscana, Marche, Umbria, Lazio, Abruzzo, Campania, and Sardegna (Galasso et al 2018a).

N. Olivieri

Impatiens balsamina L. (Balsaminaceae)

+ (CAS) **LAZ**: Alatri (Frosinone), Via Castagneto (WGS84: 41.735549N; 13.301030E), cunetta stradale, un solo individuo, 450 m, 24 July 2018, *E. Fanfarillo* (FI). – Casual alien species new for the flora of Lazio.

A single flowering individual was found growing in a grassy road ditch.

E. Fanfarillo

Juglans nigra L. (Juglandaceae)

+ (CAS) **ABR**: Rocca di Mezzo (L'Aquila), loc. Colle del Morricone, ai margini dell'abitato (WGS84: 42.208438N; 13.511394E), incolto presso il bordo stradale, ca. 1290 m, 2 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

Some young individuals grow near the roadside on a rather deep calcareous soil in an uncultivated area occupied by disturbed vegetation dominated by shrubs such as *Acer campestre* L., *A. pseudoplatanus* L., *Crataegus monogyna* Jacq., and *Prunus spinosa* L. subsp. *spinosa*. *Juglans nigra* is cultivated as ornamental in private gardens located in the area and the young plants probably originate from seeds dispersed by zoochory. This species is native to the eastern regions of North America and was introduced in Italy in 1760 (Maniero 2015), where it is currently cultivated for the production of wood and for ornamental purposes in parks and along roads. It is known as a casual alien in Piemonte, Trentino-Alto Adige, Emilia-Romagna, Umbria, Lazio, Campania, and Sicilia, while it is naturalized in Lombardia and invasive in Veneto (Galasso et al 2018a).

N. Olivieri

Kalanchooe ×houghtonii D.B.Ward (Crassulaceae)

+ (NAT) **LAZ**: Roma (Roma), Municipio II, Via C. De Lollis, lato N, a fianco della fermata dell'autobus "de Lollis/Irpini" (WGS84: 41.901187N; 12.515989E), interstizio tra muro e marciapiede, 43 m, 10 September 2018, *E. Fanfarillo* (FI); *ibidem*, crepe nel cemento e fessure tra tubature, 43 m, 7 December 2018, *N.M.G. Ardenghi* (FI). – Naturalized alien nothospecies new for the flora of Lazio.

This ornamental nothotaxon is frequently cultivated in gardens and balconies and can easily escape into the wild by producing abundant, promptly radicating vegetative propagules (leaf-bulbils), so that it became invasive in some areas of the world (Ward 2008; Wang et al. 2016). Several young plants were observed growing in the interstices between a wall and a sidewalk, some of them emerging even from old infructescences of *Casuarina equisetifolia* L. spread on the ground. A group of larger, vigorous and uneven-aged flowering individuals is present, at least since 2011 (as can be seen in pictures from Google Street View), at the top of the wall, growing within its cracks and nearby pipes.

E. Fanfarillo, N.M.G. Ardenghi

Koelreuteria paniculata Laxm. (Sapindaceae)

+ (CAS) **TOS**: Campiglia Marittima (Livorno), fraz. Venturina Terme (WGS84: 42.998797N; 10.516870E), tra la strada e un campo abbandonato, 18 m, 21 October 2017, *T. Fiaschi* (FI). – Casual alien species new to the flora of Toscana.

In our finding, the occurrence of this species is probably due to seed dispersed from private gardens. The escaped specimens currently found are about ten. Some of

them reach two metres in height. Since the cultivation of *Koelreuteria paniculata* in the nearby garden of Villa Boldrini, where it fructifies regularly, dates back to the end of the Nineties (C. Bertozzi, *in verbis*), the number of seeds in the soil could be much higher than the observed developed individuals, due to the very efficient exogenous and endogenous dormancy of this (Rehman and Park 2000).

G. Bonari, T. Fiaschi, R. Guarino

Lindernia dubia (L.) Pennell (Linderniaceae)

+ (NAT) **TAA**: Bondone (Trento), sponda N del Lago d'Idro a W di Baitoni inferiore, loc. Rionda, 70 m a WSW della torretta di avvistamento (WGS84: 45.8048N; 10.5307E), sponda fangosa, 370 m, 27 September 2018, *F. Prosser, R. Vicentini, F. Valentini, R. Fedrizzi, M. Merli*, det. *F. Prosser* (FI, ROV 74196). – Naturalized alien species new for the flora of Trentino-Alto Adige.

In locality of Rionda, this species forms a dense colony along about fifty metres of the shore, which can be estimated in some tens of thousands of specimens that at the observation date were in bloom and at the beginning of the fruiting. A second group of about fifty individuals was found 30 m NE from the first record (ROV 74195). Both populations fall within the Nature 2000 "Lago d'Idro" area (IT3120065), where they could compete with the rare native *Eleocharis acicularis* (L.) Roem. & Schult. *Lindernia dubia* is a species of North American origin reported in northern Italy as invasive in Piemonte and Lombardia, and naturalized in Veneto and Emilia-Romagna (Galasso et al. 2018a), where it occupies low altitude localities (Banfi and Galasso 2010). This observation confirms the ability of *L. dubia* to settle even within the Alpine chain, as already observed in Switzerland (Schoenenberger et al. 2014).

F. Prosser

Melinis repens (Willd.) Zizka subsp. *repens* (Poaceae)

+ (NAT) **SAR**: Pula (Cagliari), fraz. Santa Margherita di Pula, strada SS195 dal km 36,700 (WGS84: 39.950773N; 8.945784E), margini stradali su alluvioni quaternarie, 27 m, 14 November 2018, *G. Bacchetta, G. Calvia, I. Orrù, L. Podda* (FI, CAG). – Naturalized alien subspecies new for the flora of Sardegna. Status change from casual to naturalized alien for the flora of Italy.

Melinis repens is a grass native to South Africa (Gibbs Russell et al. 1990), that has become a problematic weed in many tropical and subtropical regions around the world (Stokes et al. 2011), especially in South America, West Indies, and western Asia (Fish et al. 2015). Currently, it has been reported in Italy as a casual alien only for Campania (Galasso et al. 2018a). In Sardegna, it has been found along roadsides, probably escaped from cultivation due to the presence of ornamental plant nurseries.

G. Bacchetta, G. Calvia, I. Orrù, L. Podda

Myriophyllum aquaticum (Vell.) Verdc. (Haloragaceae)

+ (INV) **TOS**. – Status change from naturalized to invasive alien for the flora of Toscana.

Myriophyllum aquaticum (Parrot's feather) is a species native to tropical and subtropical America, widespread in many parts of the world (Lastrucci et al. 2017b). Due to its detrimental effects on invaded ecosystems this species is considered of Union concern according to the regulation (EU) No. 1143/2014 (European Commission 2014) and it is one of the 14 species enlisted in the list of invasive alien species (IAS) of Union concern occurring in Italy (and one of the 8 recorded for Toscana, Galasso et al. 2018a). Currently *M. aquaticum* is considered invasive for Piemonte and Veneto, and naturalized for other six Italian regions, including Toscana (Galasso et al. 2018a). It was recorded for the first time in this region by Lastrucci et al. (2006) at Lake Porta (Massa-Carrara province), where it was observed spreading across the network of canals around the lake, forming dense monophytic mats or penetrating in the autochtonous coenoses (Lastrucci et al. 2016). In this area, it has been showing a clear invasive behavior spreading in spite of the control actions adopted and exerting strong impacts on native vegetation due to competition (Lastrucci et al. 2017b). Furthermore, recently *M. aquaticum* has been recorded also in the provinces of Lucca and Pisa close to Lake Massaciuccoli (Peruzzi et al. 2016; Lastrucci et al. 2017a), and it was observed in October 2018 also close to Località Montuolo (Lucca province, WGS84: 43.838378N; 10.442848E). Considering the spread of this species in the regional range, but above all the impacts documented for Lake Porta in Lastrucci et al. (2017b), we retain most appropriate the status of invasive alien in Toscana for *M. aquaticum*.

L. Lazzaro, G. Ferretti, M. Mugnai, L. Lastrucci

Nandina domestica Thunb. (Berberidaceae)

+ (CAS) **PUG**: Lecce (Lecce), aiuola nella Villa Comunale "G. Garibaldi", nei pressi di Via XXV Luglio (WGS84: 40.354586N; 18.175833E), aiuola, ca. 49 m, 23 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Some young individuals of this species have developed in a flowerbed among the branches of *Rhaphiolepis umbellata* (Thunb.) Makino, in a semi-shaded position. These individuals are located in a site characterized by a microclimate cooler than the surrounding areas, due to the presence of numerous evergreen trees, including *Quercus ilex* L. subsp. *ilex* and *Ficus elastica* Roxb. ex Hornem. The young individuals of *Nandina domestica* originated from the fruits produced by some adult plants grown in another nearby flowerbed. This species is native to China and Japan and was introduced in Italy in 1821 (Maniero 2015), where it is currently widely cultivated as ornamental, due to the bright color of the foliage and berries.

N. Olivieri

Nicotiana glauca Graham (Solanaceae)

+ (NAT) **MAR**: Fermo (Fermo), Viale XX Settembre, ai lati della strada (WGS84: 43.159477N; 13.715754E), margine stradale, argilla, in pieno suolo, ca. 230 m, 20 August 2018, *M. Tiburtini* (PI 014835). – Naturalized alien species confirmed for the flora of Marche.

This species is recorded as invasive alien in Italy, known only for historical records in Marche (Galasso et al. 2018a). The plants are randomly distributed in the old town centre, where they grow in different places, either in soil or in cracks on the old walls of the town.

M. Tiburtini

Oenothera lindheimeri (Engelm. & A.Gray) W.L.Wagner & Hoch (Onagraceae)

+ (CAS) **SIC**: Casteltermini (Agrigento), Viale Santa Elisabetta (WGS84: 37.537778N; 13.652778E), avventizia in incolti, 515 m, 11 October 2018, *S. Restivo*, det. *R. Guarino* (FI). – Casual alien species new for the flora of Sicilia.

Oenothera lindheimeri is a rhizomatous, vigorously growing herbaceous species native to southern Louisiana and Texas. So far, it has been recorded as invasive in California (Calflora 2018), Florida, Mississippi, Alabama (Darst and Gholson 2004), South Africa (McLean et al. 2018), Japan (Mito and Uesugi 2004), and China (Yan et al. 2014). In Europe, it has been recorded as casual alien in Portugal (Verloove and Sánchez Gullón 2012), Corsica (Tison 2012), Belgium (Rostański and Verloove 2015), Spain (Sánchez Gullón and Verloove 2015), Austria (Pflugbeil and Moosbrugger 2016), Greece (Raabe and Raus 2016), and Croatia (Pandža 2017). In Italy, it is recorded as a casual alien in Lombardia, Veneto, Campania, Puglia (Galasso et al. 2018a), Toscana (Galasso et al. 2018b), and Liguria (Ottonello and Longo 2018d). In our finding, the occurrence of this species is probably due to seed dispersal from private gardens nearby. It has been observed as adventitious also in eastern Sicilia, along roadsides in Fiumefreddo di Sicilia (Catania province, *R. Guarino*, pers. obs.).

S. Restivo, R. Guarino

Oxalis debilis Kunth (Oxalidaceae)

+ (CAS) **LAZ**: Roma (Roma), Municipio II, Piazza dei Siculi 2, scalinata davanti alla "Cooperativa la Risorgente" (WGS84: 41.899508N; 12.511471E), fessura alla base di gradini in marmo, 51 m, 7 December 2018, *N.M.G. Ardenghi* (FI). – Casual alien species confirmed for the flora of Lazio.

A single individual was found in Rome, within a crack at the base of marble steps. The presence of *Oxalis debilis* in Lazio was regarded as doubtful by Galasso et al. (2018a).

N.M.G. Ardenghi

Parthenocissus tricuspidata (Siebold & Zucc.) Planch. (Vitaceae)

+ (NAT) **BAS**: Matera (Matera), Sasso Barisano, lungo una scalinata (WGS84: 40.666779N; 16.609984E), mura, ca. 400 m, 25 August 2018, *L. Peruzzi, M. D'Antraccoli* (FI). – Naturalized alien species new for the flora of Basilicata.

+ (NAT) **PUG**: Monopoli (Bari), c.da Gorgofreddo, Murgia barese, lungo la SP113, 250 m a N di Monte San Nicola (WGS84: 40.89721N; 17.28361E), costone roccioso calcareo a bordo strada, 190 m, 30 August 2018, *F. Roma-Marzio, P. Liguori* (FI, *Herb. F. Roma-Marzio*). – Naturalized alien species new for the flora of Puglia.

Parthenocissus tricuspidata is a vine commonly cultivated as ornamental, almost exclusively for wall cover (Verloove 2019) native to China, Japan, and Korea (Chen and Wen 2007). In Italy, it was reported as casual or naturalized in almost all the administrative regions except for Valle d'Aosta, Marche, Molise, Puglia, Basilicata, and Calabria (Galasso et al. 2018a). In Puglia, we found fruiting plants completely covering a limestone rocky ridge for about 200 meters. In Basilicata, we observed this species also growing abundantly along a road and above overpasses in the North edge of Matera (WGS84: 40.680404N; 16.587295E).

L. Peruzzi, M. D'Antraccoli, F. Roma-Marzio

Phoenix roebelenii O'Brien (Arecaceae)

+ (CAS) **ITALIA** (**PUG**): Brindisi (Brindisi), giardini pubblici di Piazza Vittorio Emanuele II (WGS84: 40.639861N; 17.948005E), giovani piante epifite sul tronco di piante adulte coltivate, ca. 2 m, 23 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Italy (Puglia).

Some very young individuals have grown as epiphytes on the trunk of some adult plants of the same species, over 1.5 m tall, among which there is a female specimen. The young plants have developed among the residues of the leaf rachides, in the upper part of the stems. *Phoenix roebelenii* ripens the fruit and the young plants have developed from the seeds produced by the adult female individual. The species is native to southeastern Asia, from southwestern China to northern Laos and northern Vietnam, and now is a popular ornamental plant in the warm areas of the Mediterranean region, in the subtropical and tropical areas. The species has been identified according to Squire (2007) and Cullen et al. (2011).

N. Olivieri

Phyllanthus tenellus Roxb. (Phyllanthaceae)

+ (CAS) **CAL**: Villa San Giovanni (Reggio Calabria), fraz. Cannitello, in numerose fioriere con piante acquistate in vivaio, all'interno di una proprietà privata (WGS84:

38.235556N; 15.660556E), fioriere, 11 m, 19 September 2013, *C.M. Musarella*, det. *C.M. Musarella, G. Spampinato* (FI, REGGIO); Reggio Calabria (Reggio Calabria), Pellaro, proprietà privata (WGS84: 38.020000N; 15.643889E), dentro una fioriera, 11 m, 14 August 2014, *C.M. Musarella* (REGGIO); *ibidem*, in un'aiuola e diffuso in un terreno incolto, 11 m, 6 October 2018, *C.M. Musarella* (REGGIO); Reggio Calabria (Reggio Calabria), Arangea, vivaio, dentro vasi di alberi di mimosa provenienti dalla Sicilia (WGS84: 38.078056N; 15.663333E), vasi, 53 m, 23 August 2014, *C.M. Musarella* (REGGIO); Reggio Calabria (Reggio Calabria), Via Cardinale G. Portanova traversa Privata (WGS84: 38.115259N; 15.659431E), bordo strada, 63 m, 14 September 2017, *C.M. Musarella* (REGGIO); Reggio Calabria (Reggio Calabria), Gallico Marina, lungo un muro di cinta all'interno di una proprietà privata (WGS84: 38.190833N; 15.646389E), base di muro, 24 m, 12 October 2018, *V.L.A. Laface*, det. *V.L.A. Laface, C.M. Musarella, G. Spampinato* (REGGIO). – Casual alien species new for the flora of Calabria.

Initially present as weed in nurseries and vases, this species first spread inside private properties and later along the city streets. *Phyllanthus tenellus* is native to Madagascar and Mauritius's Island, and it was found naturalized in Italy firstly in several localities of Messina (Crisafulli et al. 2011). Then, Galasso et al. (2016) reported it for Genova, and more recently Spadaro and Raimondo (2017) recorded some specimens in Palermo.

C.M. Musarella, V.L.A. Laface, A. Cano-Ortiz, G. Spampinato

Physalis philadelphica Lam. (Solanaceae)

+ (CAS) **ITALIA** (**LAZ**): Ferentino (Frosinone), loc. Fresine (WGS84: 41.663546N; 13.254221E), bordo strada, 205 m, 18 July 2018, *E. Fanfarillo* (FI, RO). – Casual alien species new for the flora of Italy (Lazio).

This species is an anciently cultivated plant from Mexico and Guatemala, so far reported in Europe for Austria, Belgium, Czech Republic, France, Lithuania, and Spain (DAISIE 2018). Some individuals, possibly escaped from nearby orchards, were found growing on a roadside. The risk of confusion with the closely related *Physalis ixocarpa* Brot. ex Hornem. is high in the determination of this taxon; the attribution of the collected specimens to *P. philadelphica* was especially based on the observation of a corolla longer than 10 mm and of twisted anthers about 4 mm long (Flora Zambesiaca 2018; New England Wild Flower Society 2018).

E. Fanfarillo

Physalis viscosa L. (Solanaceae)

+ (CAS) **PUG**: Bari (Bari), loc. Canale Lamasinata (WGS84: 41.090325N; 16.845230E), bordo strada, 40 m, 20 September 2018, *G. Signorile*, det. *F.S. D'Amico* (FI). – Casual alien species new for the flora of Puglia.

Physalis viscosa is a South American species (Pignatti 2018) reported as a casual alien on the hills of Biella, in Piemonte (Soldano and Verloove 2013), and in the lower part of the River Biferno in Molise (Lucchese 2010). We observed some individuals of *P. viscosa* at the periphery of Bari, along the edge between a secondary road and the water drainage channel (i.e., Canale Lamasinata, locally called 'Canalone').

F.S. D'Amico, G. Pazienza, M. Terzi

Plumbago auriculata Lam. (Plumbaginaceae)

+ (CAS) **PUG**: Lecce (Lecce), Viale Gallipoli (WGS84: 40.348383N; 18.166944E), bordo di marciapiede, ca. 51 m, 23 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Some young individuals of the species have developed among the inner edge of the sidewalks and the perimeter wall of a private garden. Individuals have developed into interstices between sidewalk cement and vertical masonry in a rather bright area exposed to the Northeast. *Plumbago auriculata* is cultivated as ornamental in the nearby gardens and individuals have developed from the seeds produced by cultivated plants.

N. Olivieri

Pteris multifida Poir. (Pteridaceae)

+ (CAS) **LAZ**: Roma (Roma), Villa Borghese, Giardino del Lago (WGS84: 41.914N; 12.484E ± 200 m), muro umido, November 1949, *A. Cacciato*, rev. *D. Marchetti* (RO, scan in FI). – Casual alien species new for the flora of Lazio.

This pantropical species is cultivated as ornamental outside its native range and occurs as alien in northern Italy (Galasso et al. 2018a). The specimen, initially tentatively identified as *Pteris cretica* L., then revised by D. Marchetti in 1991, is the only record for peninsular Italy. According to B. Anzalone's personal notes, this specimen is to be surely referred to a population growing spontaneously that escaped from cultivation and colonized a humid wall. The growing site was recently surveyed again, but *P. multifida* has not been found.

G. Nicolella, M. Latini, M. Iberite

Quercus rubra L. (Fagaceae)

+ (CAS) **LAZ**: Roma (Roma), Villa Borghese, presso Viale dell'Uccelliera (WGS84: 41.913552N; 12.492622E), siepe di *Laurus nobilis*, ca. 50 m, 14 September 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Lazio.

Some very young individuals of this species have developed near a hedge of *Laurus nobilis* L., on soil formed by ancient pyroclastic deposits. In the area, there are several adult specimens of *Quercus ilex* L. subsp. *ilex* and *Q. rubra* L.. The latter species is

native to the eastern regions of North America and was introduced in Italy in 1803 (Maniero 2015), as a forest species and as an ornamental, especially in the northern regions. This species is known as a casual alien in Liguria, Emilia-Romagna, Trentino-Alto Adige, Friuli Venezia Giulia, and Campania, while it is naturalized in Veneto and Puglia, and is invasive in Piemonte and Lombardia (Galasso et al. 2018a).

N. Olivieri

Setaria parviflora (Poir.) Kerguélen (Poaceae)

+ (NAT) **SAR**. – Status change from casual to naturalized alien for the flora of Sardegna.

In Iscra (Illorai, Sassari), along a country road connecting the SP17 route with SS129, *Setaria parviflora* is found as fully naturalised over a large area in natural and artificial pastures and along the roadside (WGS84: 40.320190N; 9.040872E), since 2016. It is a species originating from South America, recorded as naturalised or casual in Calabria, Campania, Emilia-Romagna, Lazio, Liguria, Lombardia, Marche, Puglia, Sicilia, Toscana, and Veneto. In Sardegna, it was reported as a casual alien (Galasso et al. 2018a).

G. Brundu, V. Lozano

Symphytum asperum Lepech. (Boraginaceae)

+ (NAT) **TOS**: Borgo San Lorenzo (Firenze), Mugello, fra Razzolo e la Colla di Casaglia, presso la locanda (WGS84: 44.040039N; 11.472939E), ca. 800 m, 23 June 1907, *C. Sommier* (FI); Firenze (Firenze), Cascine, inselvatichita a Scienza dell'Orticoltura (WGS84: 43.783903N; 11.220514E ± 100 m), 42 m, 17 May 1929, *A. Fiori* (FIAF 25094); Massa Marittima (Grosseto), fraz. Prata, strada per Gabellino dopo circa 1 km (WGS84: 43.074952N; 10.998783E), erbosi freschi lungo la strada, forse sfuggito a coltura per foraggio, ca. 500 m, 1 May 2017, *F. Selvi 3801* (FI, *Herb. F. Selvi*); *ibidem*, 12 May 2018, *F. Selvi 3898* (FI, *Herb. F. Selvi*). – Naturalized alien species confirmed for the flora of Toscana.

Since long time, this Pontic-Caucasian species has been widely introduced to Europe as ornamental and for forage production. In Italy, it occurs in the northern regions (Piemonte, Lombardia, Veneto, and Friuli Venezia Giulia) and, more southwards, in Marche (Galasso et al. 2018a). It was also collected in Borgo San Lorenzo by Sommier and in Firenze by Fiori (see also Cecchi and Selvi 2017), but here this species has not been observed in more recent times and it has probably disappeared. In the new site here reported, about 20 plants grow in a fresh meadow along the SS441, close to the junction with the SP54 "Cerro Balestro". At the time of collection, the plants were blooming and the pink-violet flowers were visited by bumble bees. Observations in spring 2018 confirmed the presence of this small population, which is therefore assumed to be naturalized. It was probably established from plants previously introduced in some local farm and cultivated for the production of forage.

F. Selvi

Tagetes erecta L. (Asteraceae)

+ (CAS) **VDA**: Châtillon (Aosta), strada di accesso al parcheggio comunale pluripiano di Via R. Pellissier (WGS84: 45.750247N; 7.614914E), bordo strada, ca. 520 m, 16 September 2017, *C. Ganz* (*Herb. C. Ganz*); Pont-Saint-Martin (Aosta), terrazzamento incolto (ex-vigneto) adiacente a Via A. Chenuil (WGS84: 45.601803N; 7.792190E), incolto, ca. 350 m, 29 September 2018, *M. Lonati, A. Mainetti* (FI). – Casual alien species new for the flora of Valle d'Aosta.

This Central and South American species (Everett 1982) is widely cultivated for ornamental purposes all over the world, and it is well known for its wide range of biological activities (Singh et al. 2003). In Italy, it was already known as casual alien for most of the regions, but not yet in Valle d'Aosta (north-western Italy), Marche, Umbria, Puglia, Basilicata, and Calabria (peninsular Italy) (Galasso et al. 2018a). The recorded plants probably originated from those cultivated in nearby private gardens, colonizing roadsides, asphalt cracks, and uncultivated areas. It has also been observed and photographed in the following localities: Saint-Vincent (Aosta), fraz. Moron, parcheggio principale della frazione (WGS84: 45.751497N; 7.666617E), bordo di parcheggio, ca. 805 m, 12 August 2016; Saint-Vincent (Aosta), fraz. Capard, parcheggio principale della frazione (WGS84: 45.756422N; 7.648353E), bordo di parcheggio, ca. 660 m; Aymavilles (Aosta), capoluogo, poco sopra il cimitero comunale (WGS84: 45.700433N; 7.239597E), bordo strada, ca. 645 m, 3 September 2018; Saint-Vincent (Aosta), capoluogo in Via Prof. A. Ferré (WGS84: 45.749781N; 7.650753E), fessurazioni del marciapiede, ca. 565 m, 8 September 2018.

M. Lonati, C. Ganz, A. Mainetti

+ (CAS) **PUG**: Martina Franca (Taranto), Piazza Plebiscito lungo il perimetro della Basilica di San Martino (WGS84: 40.705467N; 17.336823E), marciapiede, 430 m, 26 August 2018, *M. D'Antraccoli, F. Angeli* (FI). – Casual alien species new for the flora of Puglia.

Possibly, the three detected individuals originated from seeds produced by plants cultivated in the centre of Martina Franca for ornamental purposes.

M. D'Antraccoli

Washingtonia filifera (Linden ex André) H.Wendl. ex de Bary (Arecaceae)

+ (CAS) **ABR**: Roseto degli Abruzzi (Teramo), presso il litorale adriatico in Viale Roma (WGS84: 42.680833N; 14.013888E), aiuola, ca. 9 m, E, 8 October 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

Washingtonia filifera is a species native to southern California, southwestern Arizona and northern Mexico, cultivated in Italy, and known as a casual alien in Liguria, Campania and Sardegna, while it is naturalized in Sicilia (Galasso et al. 2018a). Some young individuals have developed on sandy soil, at the edge of a flowerbed located in the urban area

near the Adriatic Sea, partially shaded by *Pinus pinea* L. and *P. halepensis* Mill. subsp. *halepensis*. They originate from the seeds produced by a tree growing in a nearby flowerbed.

N. Olivieri

+ (CAS) **PUG**: Lecce (Lecce), Villa Comunale "G. Garibaldi" nei pressi di Via A. Costa (WGS84: 40.354777N; 18.174555E), bordi di aiuole, 49 m, 23 August 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Some young individuals grow near the edges of flowerbeds and in cracks in the cement paving in an area located inside the Villa Comunale of Lecce. The young plants have grown from seeds produced by a tree found nearby.

N. Olivieri

Nomenclatural and distribution updates from other literature sources

Nomenclatural, status, and distribution updates according to Ross (1899), Chiovenda (1920), Cesca (1972), Viegi and Cela Renzoni (1981), Pedullà and Garbari (2002), Herman (2003), Raimondo et al. (2005), Nordenstam (2007), Domina and Mazzola (2008), Carine and Robba (2010), Arrigoni and Viegi (2011), Wood et al. (2015), Arrigoni (2016, 2017, 2018, 2019), Edwards (2017), Badalamenti and La Mantia (2018), Badalamenti et al. (2018), Cibei (2018a, 2018b), De Santis (2018a, 2018b, 2018c, 2018d), Englmaier and Wilhalm (2018), Lazzeri et al. (2018), Longo (2018), Manni (2018), Martini (2018), Nicolella (2018a, 2018b), Ottonello and Longo (2018a, 2018b, 2018c, 2018d), Pasta and Troia (2018), Pignatti (2018), Roma-Marzio et al. (2018), Stinca et al. (2018), Turland et al. (2018), Wilhalm et al. (2018), Bartolucci et al. (2019), Bovio (2019), Englmaier (2019), Lastrucci et al. (2019), Prosser et al. (2019), Stinca (2019), and corrections to Galasso et al. (2018a) are provided in Suppl. material 1.

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Supplementary material 1

Supplementary data

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Data type: species data

Explanation note: 1. Nomenclatural updates; 2. Distribution updates; 3. Synonyms, misapplied or included names.

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